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Nos. III. AND IV.

CAPILLARY TUBES IN METAL.

The Sum of FIVE POUNDS was presented to Mr. J. ROBERTS, 64 Queen Street, Cheapside, for his Method of subdividing a Pipe into Capillary Tubes; a Specimen of which has been placed in the Society's Repository.

The Thanks of the Society were voted to HEN. WILKINSON, Esq. Pall Mall, for his Method of producing a Ring of Capillary Tubes.

FOR gas-burners, for the safe combustion of mixtures of oxygen and hydrogen, and for other purposes, it is often desirable to divide the end of the discharge-pipe into fine capillary tubes, of the depth of half an inch or more. It is difficult and expensive to bore such apertures in a piece of solid metal, and it is hardly possible to be executed at all if the apertures are required to be of very small diameter.

Mr. Roberts very ingeniously and expeditiously subdivides the end of a metal pipe into small tubes of any required depth, by means of pinion-wire. Pinion-wire is made by taking a cylindrical wire of soft steel, and passing it through a draw-plate of such a figure as to form on its surface deep grooves in the direction of radii to the axis of the wire: the ribs which separate these grooves from one another may be considered as leaves or teeth, and of such wire, when cut into proper lengths, are made the pinions

used by watchmakers. Hence arises the name by which this wire is commonly known. If now a piece of this wire be driven into the end of a brass pipe of such a size as to make a close fit with it, it is evident that that part of the pipe has thus been subdivided into as many smaller tubes as there are grooves in the wire. By using a draw-plate fitted to make smaller and shallower and more numerous grooves than are required in common pinion-wire, it is manifest that wires or cores may be produced, which, when driven into metal pipes, as already described, will subdivide them into capillary tubes of almost any degree of tenuity.

Mr. H. Wilkinson's method is described in the following letter :

SIR,

Pall Mall, May 25th, 1835.

In the course of some experiments on artificial light, which I was engaged in about twelve months since, I was desirous of obtaining a great number of extremely minute apertures for a gas-burner; and, finding it impossible, in the ordinary way, to obtain them, a new method occurred to me, which immediately produced the desired effect. I shewed it at the time to several eminent scientific men, who were unable to conceive how these apertures were formed; and, as I made no secret of the method, they were equally pleased at the simplicity of the operation; and the specimen herewith sent has been exhibiting at the Gallery of Practical Science for several months. I did not attach much importance to it myself; but, as I do not find that it is at all known, and now think it might be useful in a variety of ways, I have sent it for you to lay before the Society; and should they be of the same opinion, I shall

feel much pleasure in communicating the mode of operation, by which any number of apertures, hardly visible to the naked eye, and of any length (*even a foot, if required*), may be made in any metal in *ten minutes!*

I am, Sir, &c. &c.

A. AIKIN, Esq.

HENRY WILKINSON.

Secretary, &c. &c.

The process consists merely in turning one cylinder to fit another very accurately, and then, by milling the outside of the inner cylinder with a straight milling tool of the required degree of fineness, and afterwards sliding the milled cylinder within the other, apertures are produced perfectly distinct, and of course of the same length as the milled cylinder. A similar effect may be produced on flat surfaces, if required.

H. W.

No. V.

COPAL VARNISH.

Letter from Mr. C. VARLEY, on Copal Varnish.

7 Charles Street, Clarendon Square,
November, 1835.

SIR,

THE letter of mine, in the first part of this volume, on the essential oil of spruce, was written in February 1827, when the first small quantity only had been received by the Society. My letter was accompanied with specimens